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# 1

## Introduction and Background

### 1.1 PURPOSE OF THE WATERSHED SANITARY SURVEY UPDATE

The California Department of Health Services (DHS), under California Surface Water Treatment regulations, requires that all water purveyors perform a sanitary survey of their water source watersheds and update it every 5 years. These regulations implement the federal Surface Water Treatment Rule (SWTR), which became effective on 31 December 1990.

The purpose of a watershed sanitary survey is to:

- Describe control and management practices,
- Describe potential contaminant sources or activities (PCSs) and their effect on drinking water source quality,
- Determine if appropriate treatment is provided, and
- Identify actions and recommendations to improve or control contaminant sources.

### 1.2 HISTORY OF THE SWP SANITARY SURVEY UPDATE 2001

After completion of the initial State Water Project (SWP) *Sanitary Survey* in 1990, a SWP Sanitary Survey Action Committee (SSAC) was formed. It consisted of staff from the California Department of Water Resources (DWR) and DHS's Drinking Water Program, representatives of the State Water Contractors and consultants. The SSAC's role was to follow up on the report's recommendations. The SSAC's work resulted in the State Water Project Action Plan. This action committee has continued to meet over the years, and although individual membership has changed, the SSAC makeup has remained the same.

The SSAC has taken on the task of providing guidance for the 5-year updates of the *Sanitary Survey*. The *Sanitary Survey Update Report 1996* focused on changes in SWP watersheds and water quality since 1990. The update also provided information from site visits to watersheds—Del Valle, San Luis, Pyramid, Castaic, Silverwood, Perris, Barker Slough/North Bay Aqueduct watershed, and the open channel section of Coastal Aqueduct. An emphasis was placed on the occurrence of coliforms and the pathogens *Giardia* and *cryptosporidium*. The *Update 1996*, completed in May 1996, included the results of an extensive

database search on toxic sites within SWP watersheds.

### 1.3 COORDINATION WITH STAKEHOLDERS

Preparation for the *Sanitary Survey Update Report 2001* began July 1999 with SSAC meetings to discuss and develop a work plan and scope of work. The SSAC approved a draft work plan and schedule in September 1999 and adopted the final work plan in December 1999.

In May 2000, SSAC members with specific expertise and/or access volunteered to work as a subgroup to expedite the information retrieval, evaluation, and feedback process for the 2001 update. Those seven members represented DHS, SWP contractors, Metropolitan Water District of Southern California (MWDSC), Santa Clara Valley Water District (SCVWD), DWR's Operations and Maintenance Division (O&M), and the California Urban Water Agencies (CUWA).

Following work plan development, DWR's Municipal Water Quality Investigations (MWQI) management and staff, DHS staff, and the SSAC established agreements to help assure adequate progress, the obtainment of necessary information, and feedback on document content quality.

In conjunction with the agreements, this group—SSAC subgroup, MWQI and DHS staff—held frequent and focused meetings and conference calls

to track progress, discuss schedule and resource issues, and prioritize tasks.

DHS granted a schedule extension, which was requested because of staffing resource issues and difficulty in obtaining available information. The original delivery date of January 2001 for the final review draft was eventually changed to 4 May 2001. Because of time constraints, not all chapters were reviewed by the SSAC prior to the release of the final review draft. The SSAC, DHS, and DWR staff conducted a thorough review of the final review draft chapters and after a review of the comments, the document was edited to achieve technical accuracy and consistent formatting.

#### 1.4 2001 SANITARY SURVEY ASSESSMENT APPROACH

*Sanitary Survey Update Report 2001* offers detailed evaluations of study areas and issues that were selected based on actions and recommendations from previous reports and concerns stemming from new data and information. Findings and recommendations in *Update 1996* led to extensive studies of the Barker Slough watershed and pathogens in source waters. Each of these follow-up activities is covered in detail in its own chapter.

The SSAC work plan specified that *Sanitary Survey Update 2001* would rely on existing data and information from DWR, MWDSC, and other agencies and would require extensive coordination and cooperation to obtain relevant information from several federal, State, and local sources.

During work plan development, it was agreed to provide information in *Sanitary Survey Update 2001* to make it useful for SWP utilities in complying with the California Drinking Water Source Assessment and Protection (DWSAP) Program. The relationship of the *Sanitary Survey Update 2001* to the DWSAP Program is discussed in section 1.8. *Sanitary Survey Update 2001* is not required by the DWSAP Program but much of its PCS information is readily available for incorporation into a source water assessment as required by the DWSAP Program.

A key task in the work plan was the preparation of a sanitary survey questionnaire and its distribution to SWP contractors. This approach was also used for the *Sanitary Survey Update 1996*. The questionnaire was used to obtain information in the most efficient and direct way possible on contaminant sources, available data, and major water quality issues. Of the 29 contractors, 12 responded to the questionnaire (several contractors were not using SWP water at the time).

#### 1.5 SCOPE OF WORK FOR EACH SWP WATERSHED

During the development process for *Sanitary Survey Update 2001*, DWR stated that new field reconnaissance surveys and additional monitoring studies would not be performed specifically for the update. The exception was a 4-year study of the Barker Slough watershed because *Sanitary Survey Update 1996* recommended an investigation.

The major *Sanitary Survey Update 2001* tasks performed for each watershed study include:

- Review and evaluation of the results from the questionnaire sent to SWP contractors,
- Personal communication with staff of various agencies and review of pertinent reports and data about major water quality issues,
- Delineation and mapping of each source watershed area.
- Evaluation of areas and contaminants of known or suspected concern, as directed by DHS and the SSAC,
  - Development of inventories of PCSs and activities in each area.
  - Determination of the susceptibility of the water supplies of each area to those contaminant sources and activities.
- Reports and summaries of the results; identification and rating of significant PCSs and development of recommended actions to reduce the susceptibility of water supplies to existing and future water quality problems.

#### 1.6 SELECTION AND EVALUATION OF POTENTIAL CONTAMINANT SOURCES

The general types of PCSs used in the *Sanitary Survey Update 2001* were developed with SSAC input and the *American Water Works Association Guidance Manual*. They are presented below.

- Recreation
- Wastewater treatment/facilities (includes treatment plant effluent discharges, storage, transport, treatment, disposal to land, and septic systems)
- Urban runoff
- Animal populations (includes grazing, dairies, and wild animal populations)
- Algal blooms
- Agricultural activities (includes agricultural cropland use, pesticide/herbicide use, and agricultural drainage)
- Mining
- Solid or hazardous waste disposal facilities
- Logging

- Unauthorized activity (includes illegal dumping, leaking underground tank)
- Traffic accidents/spills
- Groundwater discharges
- Seawater intrusion
- Geologic hazards (landslides, earthquakes, floods)
- Fires
- Land use changes

Different PCSs can require different approaches and types of data for evaluation. In general, susceptibility to PCSs in a given watershed was determined through the questionnaire and information and data obtained in response to the following criteria:

- Frequency of drinking water regulations (maximum contaminant levels) being actually or nearly exceeded at the water treatment plant intakes, reservoirs, and in the treated water, including complaints about taste and odor.
- Constituents of concern (COC) causing additional water treatment costs or affecting treatment operations (for example, TOC removal requirement).
- Proximity of PCS to source waters (for example, reservoirs, streams) and/or treatment plant intakes.
- Beach closures due to high bacteria counts or wastes or spills associated with certain PCSs (for example, water recreation, sewage spills, septic tank leaks).
- Available water quality data on receiving water downstream of PCS areas and upstream of the nearest water supply diversions. Comparison between these locations, including at the water supply intake.
  - The lack of data or the need to do a more thorough assessment of the susceptibility of the watershed to 1 or more PCSs.

## 1.7 REPORT ORGANIZATION

### 1.7.1 CHAPTER PRESENTATION

The *Sanitary Survey Update 2001* watershed chapters are organized by geographical areas, such as the 4 Southern California reservoirs, or by spatial connection, such as the 5 sections of the California Aqueduct. Figure 1-1 shows the approximate geographical location of the watersheds covered in the chapters and their corresponding sections of the SWP. The following SWP structures and their corresponding watersheds are covered in *Sanitary Survey Update 2001*:

- SWP reservoirs
  - Pyramid Lake
  - Castaic Lake
  - Silverwood Lake
  - Lake Perris
  - San Luis Reservoir
  - Lake Del Valle
- SWP aqueducts
  - North Bay Aqueduct (Barker Slough watershed)
  - South Bay Aqueduct
  - California Aqueduct sections:
    - H. O. Banks Pumping Plant to O'Neill Forebay/ Check 13
    - O'Neill Forebay
    - O'Neill Forebay to Avenal
    - Avenal to Kern River Intertie (Check 28)
    - Kern River Intertie to East/West Bifurcation (Check 41)
  - Coastal Branch
  - East Branch and West Branch
- Harvey O. Banks Delta Pumping Plant
  - The Sacramento San Joaquin Delta and watersheds of the Sacramento and San Joaquin rivers



Figure 1-1 Sanitary Survey Chapters and Corresponding Watersheds







At the beginning of each watershed section, a summary matrix shows the assessed threat a PCS poses for that particular watershed and water supply system. The matrix also shows the chapter section where the PCS is presented in detail. The chapter then presents the following information:

- Descriptions of land use, geology and soils, vegetation, and hydrology of each watershed area or descriptions of the SWP aqueduct branches for the water supply system site.
- Identification of PCSs for each area.
- Summary of water quality data.
- Discussion of the significance of the PCS(s) to each area.
- Watershed management practices.

Including this introductory chapter, 5 chapters do not focus on a particular watershed. Chapter 2 summarizes current laws and regulations for drinking water. Chapter 11 describes the SWP Emergency Action Plan and related information. Chapter 12 presents and discusses pathogen data, which DHS and the SSAC considered necessary to include in this report. Chapter 13 contains conclusions and recommendations for the PCSs and water quality issues presented in chapters 3 through 10.

### 1.7.2 SIGNIFICANCE MATRICES

Significance matrices provide a new approach for the SWP *Sanitary Survey* to give the reader a visual summary of the relative importance of PCSs in a watershed. Each watershed chapter begins with a matrix, which operates as a “road map” by providing a quick assessment of the most important PCSs and directing the reader to corresponding chapter sections. The matrices are not absolute ratings of importance. A chapter should be read completely to gain a full understanding of the potential threats to drinking water quality. Each PCS that threatens drinking water contamination of a water supply system was rated as follows:

- PCS is a highly significant threat to drinking water quality
- ◐ PCS is a medium threat to drinking water quality
- ⊙ PCS is a potential threat, but available information is inadequate to rate the threat.
- PCS is a minor threat to drinking water quality

In each matrix, symbols represent ratings, and numbers stand for the chapter section in which the PCS is discussed. The ratings were based on data and information collected during research for *Sanitary Survey Update 2001*. Some data provided a clear connection between the PCS and its potential to contaminate drinking water. Some information was anecdotal and based on the collective knowledge and experience of the author investigating a source, as well as other SS Update authors and staff of the DWR Water Quality Assessment Branch.. In some cases, where a PCS was a clear source of the contaminant but the linkage as a threat was unclear, the PCS was given a medium rating. Sometimes a PCS was a clear source of the contaminant, but evidence and data indicated the source was not a threat to drinking water. In these cases, the PCS received a minor threat rating, for example, pesticides in the Delta watersheds.

Chapter headings for PCSs initially were drawn from a master list approved by the SSAC work team in fall 1999. The list had to be varied and expanded because of the extreme variation in geographical areas and settings for each chapter.

### 1.7.3 DEVELOPMENT OF CONCLUSIONS AND RECOMMENDATIONS

Conclusions and recommendations in chapter 13 were developed at 5 workshops where SSAC and other staff reviewed and discussed authors’ drafts and provided extensive input and revision. Detail of the process and content is provided in the introduction to chapter 13. It must be emphasized that chapter 13 is not a “stand-alone” chapter and that each chapter must be reviewed to obtain a complete picture of the status of a particular watershed. Only significant PCSs were included in chapter 13’s conclusions and recommendations.

## 1.8 RELATIONSHIP WITH DHS’S DRINKING WATER SOURCE ASSESSMENT AND PROTECTION (DWSAP) PROGRAM

Under the 1996 reauthorization of the Safe Drinking Water Act (SDWA), all states must complete a source water assessment (SWA) for public water systems by 2003. A SWA document is prepared to determine the existence of PCSs, to determine the appropriate monitoring needed, to inform the public, and to assist in the development of watershed protection programs. The DWSAP Program presents a set of standardized procedures for conducting a SWA. The DHS allows watershed sanitary surveys, like the *Sanitary Survey Update Report 2001*, as alternative methods of determining a water source’s vulnerability.

While its requirements are similar, *Sanitary Survey Update Report 2001* contains more information than a SWA. Because of the vast size of the SWP, many subwatersheds interconnect with it. The major tasks of developing this sanitary survey consisted of separate assessments for each of the subwatersheds selected for inclusion. The DWSAP Program assessment and vulnerability summary of sources that are part of the SWP may be based on the information contained in this *Sanitary Survey Update*.

DHS will use the *Sanitary Survey Update Report 2001* as the basis of the DWSAP Program's source water assessment for SWP facilities and for the preparation of vulnerability summaries for those facilities. DHS will work with contractors and water utilities to complete the SWAs. Water utilities then will be required to include information about the assessments and vulnerability summary language in their Consumer Confidence Reports (Walker pers. comm).

There are 6 information requirements that SWP contractors will be required to supply for their DWSAP Program assessments. Contractors will prepare their own DWSAP Program assessments for DHS, based on *Sanitary Survey Update 2001* information, to include the following:

- 1) Location of Supply Source.
- 2) Delineation of Source Areas and/or Protection Zones—Watershed will be designated as the source area/protection zone. This sanitary survey will provide the detailed information on the watershed, so each contractor's SWA can refer to the *2001 Sanitary Survey Update Report*.
- 3) Evaluation of Physical Barrier Effectiveness—DHS will provide standard language on this.
- 4) Inventory of Possible Contaminating Activities—This is identified in the *2001 Sanitary Survey Update Report*. Water contractors can refer to the update and provide limited description in DWSAP Program document.
- 5) Vulnerability Ranking—After review of raw water quality data provided by DWR and the water contractors, a consistent approach for each contractor to use in assessing vulnerability will be developed.
- 6) Assessment Map—*2001 Sanitary Survey Update Report* contains maps of watershed showing major land uses pipelines, any intakes, etc.

## Reference

### PERSONAL COMMUNICATION

Walker, Leah, Senior Engineer, Department of Health Services, Drinking Water Program. 1999. E-mail to Mike Zanolli, DWR. Nov 23.